

Trend Study 18-9-97

Study site name: Left Fork Settlement Canyon.

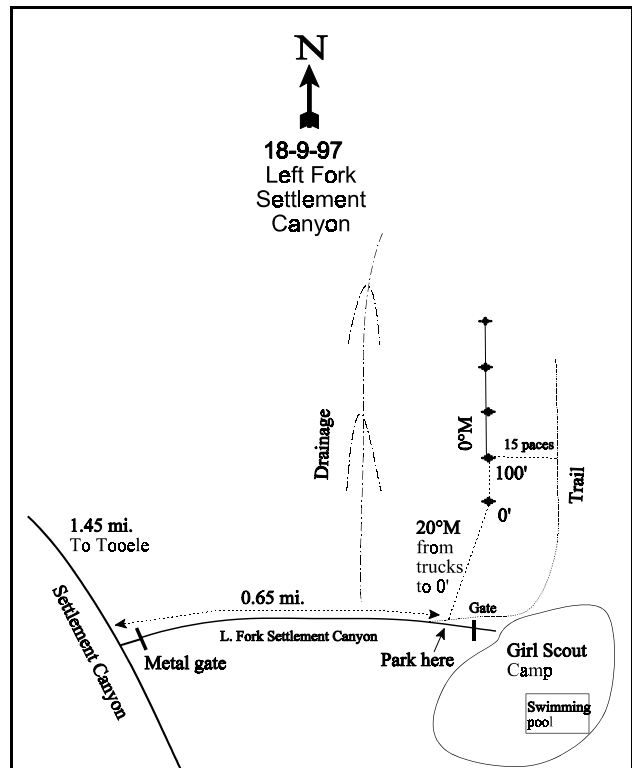
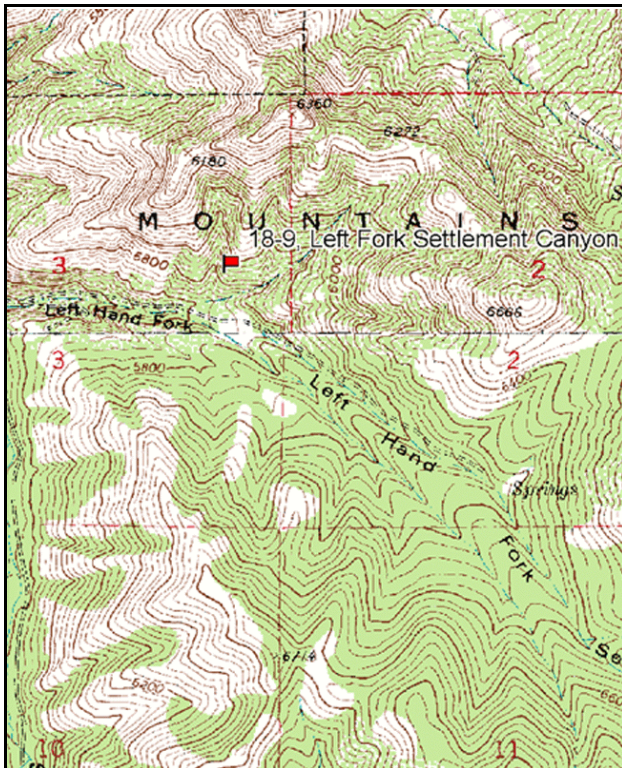
Vegetation type: Gambel Oakbrush.

Compass bearing: frequency baseline 0 degrees magnetic.

Frequency belt placement: line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

From Tooele, proceed southeast on the Settlement Canyon road to the lefthand fork, a distance of approximately 1.45 miles. Turn east (left) on the lefthand fork road and travel 0.65 miles. Turn north on an indistinct dirt road, directly across from the Girl Scout Camp and travel 0.05 miles to the base of a moderately steep dugway. From here, the 0-foot mark is found at an azimuth of 20°M. There is a trail that goes up the dugway. Follow this trail up and the 0-foot stake is 15 paces to the left of the trail and is marked with a red browse tag, number 3930.

Map Name: Tooele

Diagrammatic Sketch

Township 4S, Range 4W, Section 3

GPS: NAD 27, UTM 12S 4484039 N 391867 E

DISCUSSION

Left Fork Settlement Canyon - Trend Study No. 18-9

***SUSPENDED - This site was suspended in 2002 and replaced with a new study, 18-35 Settlement Canyon Reservoir. Text and tables from the 1997 report have been retained and are found below.

The Left Fork of Settlement Canyon study is on deer winter range. Located immediately north of the Girl Scout Camp, the area receives considerable summer recreational and horse use. In previous years heavy sheep use occurred. However, in 1983 the local conservation officer said that sheep use had been curtailed. At the time of study establishment, cattle were observed in the immediate area. The study is located within low growing Gambel oakbrush on a moderately steep slope (25%) with a south facing aspect. The site has an elevation of 5,500 feet.

Soil is moderately shallow and characterized by many small to medium sized grey-colored angular surface limestone rock that contributes to almost a 20% of the ground cover. Effective rooting depth was a little over 10 inches. Soil textural analysis indicates a clay loam with a mildly alkaline pH (7.5). Soil temperature at about 12 inches was 54°F. Erosion is normal for this kind of site, especially in the more open areas. Ground cover is irregular with patches of oak separated by open interspaces dominated by mountain big sagebrush and broom snakeweed. Percent bare soil has decreased down to only about 2% by 1997.

Browse composition consists primarily of Gambel oak, broom snakeweed, mountain big sagebrush, and prickly pear cactus which are in order of abundance. Gambel oak is the "key species" as it makes up 76% of the browse cover. The population showed moderate to heavy use in 1983 and 1989 and good vigor with an age structure dominated by young plants. It is now mostly classified as mature (65%) plants. Broom snakeweed is also abundant and found increasing in 1989. By 1997, it appeared to be on the decline, but this was mostly reflective of the much larger sample size giving a more conservative yet more accurate population estimate. It is currently the most common shrub in oak openings, with oak showing signs of slow encroachment. Mountain big sagebrush is currently showing a moderate to light hedged form and a decreasing density. The population was initially low, and now it is even more so. It contributes to less than 1% of the browse cover. This is understandable with competition from the oakbrush and the fairly abundant weedy grass understory of cheatgrass and bulbous bluegrass.

Herbaceous understory is dominated by grasses, especially cheatgrass brome, bulbous bluegrass, and bluebunch wheatgrass. Together they provide 84% of the total grass cover. Other perennial grasses occur infrequently. The abundance of annual grass and bulbous bluegrass, which is annual-like in growth habit, is an indication of the intense grazing pressure applied to this site in the past.

Forb composition consists chiefly of poor value increasers. These include bastard toadflax, Utah milkvetch, goldenrod, thistle, and yellow salsify. More palatable forbs are much less common. Grazing use of forbs is light overall but varies somewhat with species.

1983 APPARENT TREND ASSESSMENT

Soil trend appears stable. Current erosion is light to moderate but could decrease if grazing, especially from sheep, were to be reduced. A thickening oak stand will likely result in better overall ground cover which, in the long term, could result in better soil protection. Vegetation trend also appears stable. Although oak appears to be expanding, moderately heavy use will tend to keep it at below average height. A dense growth of head-high or higher oak is not expected. Broom snakeweed appears to be increasing but not rapidly. If oak continues to spread, snakeweed will become less of a competitive factor. Mountain big sagebrush is currently an important browse but will become less so in the years ahead. No rapid change in herbaceous composition or density should be expected, unless livestock use is eliminated completely.

1989 TREND ASSESSMENT

Soil trend is stable with percent bare soil down slightly. The trend for browse is stable with the majority of the browse cover being contributed by oakbrush. Mountain big sagebrush is declining and becoming an insignificant part of the community. Oakbrush is increasing in its dominance of the area. The grasses and forbs show upward trends with increased numbers and species. This increase is especially evident for the forbs.

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - up (5)

1997 TREND ASSESSMENT

Soil trend is considered stable with percent bare soil decreasing to 2%. However, this decline comes partly from an increase in rock cover (11% to 18%). The browse trend is also considered stable. The key species is oakbrush which contributes 76% of the browse cover, while mountain big sagebrush accounts for less than 1% of the browse cover. Density of oakbrush has declined 51% since 1989, but this more conservative population estimate is a more accurate estimate and more reflective of the larger sample size and not necessarily a loss in numbers. The population of oak is lightly utilized, and in good vigor. Mountain big sagebrush occur in low numbers and will become a less meaningful part of the browse composition due to the dense understory of very competitive grasses (cheatgrass and bulbous bluegrass) which make it very difficult for sagebrush to become established from seed. The herbaceous understory trend is up with increases for bluebunch wheatgrass and many forbs. The major problem is that the majority of the herbaceous species are weedy increasers.

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - up, but mostly composed of weedy species (5)

HERBACEOUS TRENDS --

Herd unit 18 , Study no: 9

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %
		'83	'89	'97	'83	'89	'97	
G	Agropyron spicatum	84	63	91	36	26	30	3.62
G	Aristida purpurea	a-	a2	b36	-	2	20	1.08
G	Bromus tectorum (a)	-	-	189	-	-	71	1.79
G	Festuca spp.	-	-	6	-	-	2	.03
G	Oryzopsis hymenoides	b13	b20	a2	6	7	2	.18
G	Poa bulbosa	a-	b17	c165	-	7	54	6.28
G	Poa pratensis	a4	b27	ab21	2	11	7	.42
G	Poa secunda	a14	b34	ab27	7	16	10	.64
G	Sitanion hystrix	1	-	-	1	-	-	-

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %
		'83	'89	'97	'83	'89	'97	'97
	Total for Annual Grasses	0	0	189	0	0	71	1.79
	Total for Perennial Grasses	116	163	348	52	69	125	12.27
	Total for Grasses	116	163	537	52	69	196	14.07
F	Agoseris glauca	-	3	2	-	2	1	.00
F	Alyssum alyssoides (a)	-	-	29	-	-	14	.12
F	Artemisia ludoviciana	6	5	8	3	2	4	.42
F	Asclepias asperula	3	4	12	1	3	5	.62
F	Aster chilensis	_a 6	_b 59	_b 35	2	22	13	1.44
F	Astragalus spp.	_a -	_a -	_b 7	-	-	4	.09
F	Balsamorhiza hookeri	_a -	_a -	_b 11	-	-	4	.39
F	Carduus nutans (a)	-	-	12	-	-	6	.05
F	Calochortus nuttallii	-	4	3	-	3	1	.00
F	Cirsium spp.	19	12	14	9	6	7	.36
F	Comandra pallida	_b 55	_b 37	_a 8	26	21	5	.08
F	Collinsia parviflora (a)	-	-	1	-	-	1	.00
F	Crepis acuminata	_a 3	_b 15	_a 2	2	8	1	.15
F	Cruciferae	-	3	-	-	1	-	-
F	Cymopterus spp.	-	3	3	-	1	1	.00
F	Draba spp. (a)	-	-	64	-	-	19	.71
F	Epilobium brachycarpum (a)	-	-	71	-	-	30	.32
F	Erodium cicutarium (a)	-	-	97	-	-	36	.74
F	Erigeron divergens	_a -	_a -	_b 19	-	-	9	.32
F	Galium aparine (a)	-	-	104	-	-	36	2.44
F	Gayophytum ramosissimum (a)	-	45	89	-	24	31	1.22
F	Grindelia squarrosa	-	-	1	-	-	1	.03
F	Hackelia patens	-	4	3	-	3	1	.03
F	Hedysarum boreale	3	6	-	1	3	-	-
F	Heterotheca villosa	_a -	_a -	_b 38	-	-	19	.78
F	Holosteum umbellatum (a)	-	-	39	-	-	16	.10
F	Ipomopsis aggregata	3	2	-	2	1	-	-
F	Lappula occidentalis (a)	-	-	11	-	-	7	.06
F	Lactuca serriola	-	18	14	-	11	8	.04
F	Lithospermum ruderales	-	6	-	-	3	-	-
F	Lygodesmia grandiflora	6	-	8	2	-	4	.02
F	Microsteris gracilis (a)	-	-	2	-	-	1	.00
F	Oenothera caespitosa	3	3	-	2	2	-	-

T y p e	Species	Nested Frequency			Quadrat Frequency			Average Cover %
		'83	'89	'97	'83	'89	'97	'97
F	Phlox longifolia	_a -	_c 46	_b 21	-	19	9	.09
F	Polygonum douglasii (a)	-	-	28	-	-	10	.05
F	Ranunculus testiculatus (a)	-	-	23	-	-	8	.09
F	Senecio spp.	-	2	-	-	1	-	-
F	Silene spp.	-	-	5	-	-	3	.01
F	Solidago sparsiflora	_c 75	_b 43	_a -	26	17	-	-
F	Tragopogon dubius	31	17	34	14	10	18	.27
F	Trifolium spp.	_a -	_b 15	_b 21	-	8	8	1.22
F	Unknown forb-perennial	-	1	-	-	1	-	-
F	Veronica biloba (a)	-	-	39	-	-	15	.10
F	Viola spp.	-	2	-	-	1	-	-
F	Zigadenus paniculatus	_a 2	_b 40	_a 2	2	20	2	.01
Total for Annual Forbs		0	45	609	0	24	230	6.04
Total for Perennial Forbs		215	350	271	92	169	128	6.43
Total for Forbs		215	395	880	92	193	358	12.47

Values with different subscript letters are significantly different at alpha = 0.10

BROWSE TRENDS --

Herd unit 18 , Study no: 9

T y p e	Species	Strip Frequency	Average Cover %
		'97	'97
B	Artemisia tridentata vaseyana	3	.18
B	Gutierrezia sarothrae	73	5.92
B	Opuntia spp.	19	.22
B	Quercus gambelii	60	19.75
Total for Browse		155	26.07

BASIC COVER --

Herd unit 18 , Study no: 9

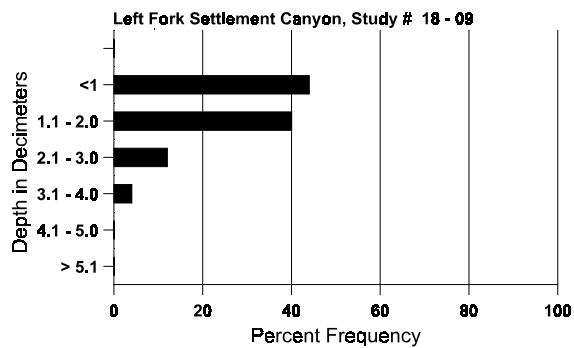
Cover Type	Nested Frequency '97	Average Cover %		
		'83	'89	'97
Vegetation	366	0	6.75	49.60
Rock	282	7.75	11.25	18.67
Pavement	140	0	3.25	2.38
Litter	386	74.50	63.50	51.46
Cryptogams	105	0	0	2.96
Bare Ground	110	17.75	15.25	1.93

SOIL ANALYSIS DATA --

Herd Unit 18, Study no: 9, Left Fork Settlement Canyon

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
10.2	54.0 (12.4)	7.5	44.0	24.1	31.9	2.6	18.5	102.4	.4

Stoniness Index



PELLET GROUP FREQUENCY --

Herd unit 18 , Study no: 9

Type	Quadrat Frequency '97
Rabbit	4
Elk	2
Deer	12

BROWSE CHARACTERISTICS --

Herd unit 18 , Study no: 9

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Artemisia tridentata vaseyana																		
Y	83	3	-	-	-	-	-	-	-	-	3	-	-	-	200			3
	89	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	83	-	2	-	-	-	-	-	-	-	2	-	-	-	133	20	20	2
	89	2	1	-	-	-	-	-	-	-	3	-	-	-	200	15	17	3
	97	3	1	-	-	-	-	-	-	-	4	-	-	-	80	15	26	4
D	83	-	1	-	-	-	-	-	-	-	-	-	1	-	66			1
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'83		50%			00%			17%			-33%							
'89		25%			00%			00%			-70%							
'97		25%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'83	399	Dec:	17%			
												'89	266		0%			
												'97	80		0%			
Gutierrezia sarothrae																		
S	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	21	-	-	-	-	-	-	-	-	21	-	-	-	1400			21
	97	23	-	-	-	-	-	-	-	-	23	-	-	-	460			23
Y	83	42	-	-	-	-	-	-	-	-	42	-	-	-	2800			42
	89	42	-	-	-	-	-	-	-	-	42	-	-	-	2800			42
	97	34	-	-	-	-	-	-	-	-	34	-	-	-	700			35
M	83	93	-	-	-	-	-	-	-	-	93	-	-	-	6200	10	7	93
	89	53	-	-	-	-	-	-	-	-	53	-	-	-	3533	11	6	53
	97	649	-	-	1	-	-	-	-	-	650	-	-	-	13000	9	11	650
D	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	26	-	-	-	-	-	-	-	-	26	-	-	-	1733			26
	97	2	-	-	-	-	-	-	-	-	-	-	-	2	40			2
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'83		00%			00%			00%			-10%							
'89		00%			00%			00%			+41%							
'97		00%			00%			.29%										
Total Plants/Acre (excluding Dead & Seedlings)												'83	9000	Dec:	0%			
												'89	8066		21%			
												'97	13740		0%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches)		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4		Ht.	Cr.	
Opuntia spp.																		
Y	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	89	1	-	-	-	-	-	-	-	-	-	-	-	-	66		1	
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	83	1	-	-	-	-	-	-	-	-	1	-	-	-	66	4	10	
	89	1	-	-	-	-	-	-	-	-	-	1	-	-	66	5	10	
	97	25	-	-	-	-	-	-	-	-	25	-	-	-	500	6	12	
D	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	97	6	-	-	-	-	-	-	-	-	1	-	-	5	120		6	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'83		00%			00%			00%			+50%							
'89		00%			00%			00%			+79%							
'97		00%			00%			16%										
Total Plants/Acre (excluding Dead & Seedlings)												'83	66	Dec:	0%			
												'89	132		0%			
												'97	620		19%			
Quercus gambelii																		
S	83	8	-	-	-	-	-	-	-	-	8	-	-	-	533		8	
	89	224	1	-	-	-	-	-	-	-	224	-	1	-	15000		225	
	97	102	-	-	-	-	-	-	-	-	102	-	-	-	2040		102	
Y	83	93	49	-	-	-	-	-	-	-	141	1	-	-	9466		142	
	89	194	161	4	-	-	-	-	-	-	198	60	101	-	23933		359	
	97	124	-	-	31	-	-	49	-	4	208	-	-	-	4160		208	
M	83	-	80	30	-	-	-	-	-	-	110	-	-	-	7333	29	16	
	89	1	1	2	-	-	-	-	-	-	2	-	2	-	266	66	39	
	97	370	4	-	53	-	-	-	-	-	427	-	-	-	8540	31	23	
D	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	89	5	25	8	-	-	-	-	-	-	7	1	30	-	2533		38	
	97	18	-	-	1	-	-	-	-	-	19	-	-	-	380		19	
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	2140		107	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'83		51%			12%			00%			+37%							
'89		47%			03%			33%			-51%							
'97		.61%			.61%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'83	16799	Dec:	0%			
												'89	26732		9%			
												'97	13080		3%			